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SLIDING CONNECTION BETWEEN SEAT RAILS AND LEGS OF COLLAPSIBLE WHEEL CHAIRS

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FIG. 1.

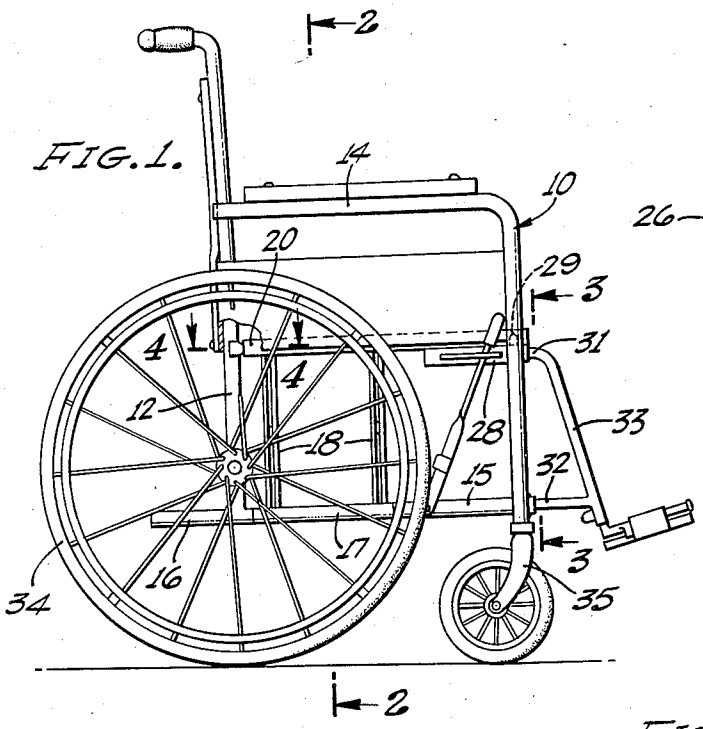
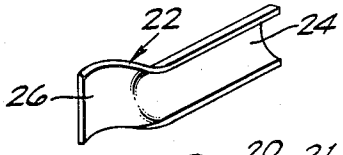


FIG. 5.



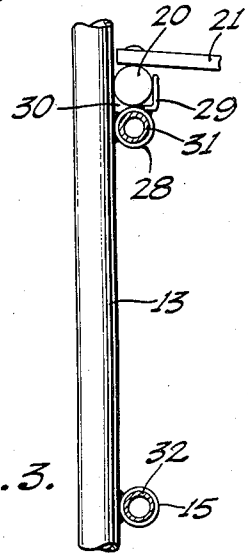


FIG. 3.

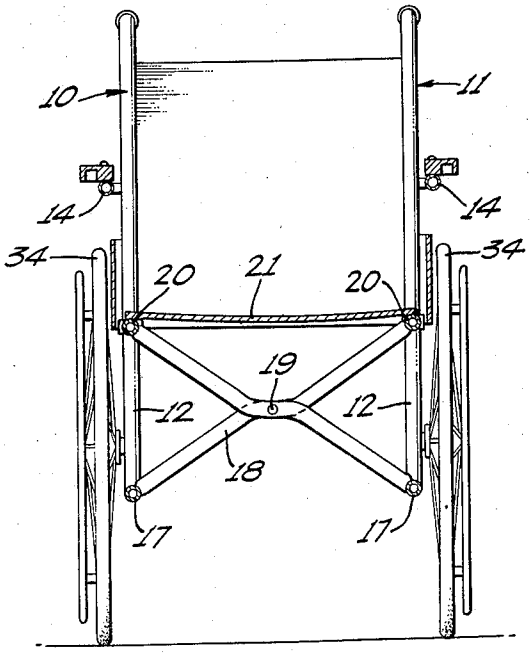


FIG. 2.

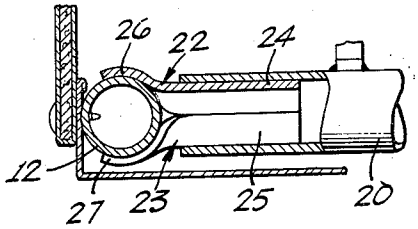


FIG. 4.

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SLIDING CONNECTION BETWEEN SEAT RAILS AND LEGS OF COLLAPSIBLE WHEEL CHAIRS

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2 Claims. (Cl. 155—140)

This invention relates to improvements in collapsible chairs such as collapsible invalid wheel chairs.

Explanatory of the present invention, collapsible wheel chairs have heretofore been designed consisting of two opposed side frames each of which has a front and rear leg. These side frames have been connected to their lower ends by the lower ends of one or more X-braces which have seat bars or seat rails at their upper ends. These seat bars or seat rails have been connected by a flexible seat and when it is desired to collapse the chair the side frames are merely pushed toward each other causing the X-braces to fold or collapse and the flexible seat to fold between the seat bars. Heretofore the ends of the seat bars have been usually slidably and rotatably connected to the front and rear legs of their respective side frames and to this end notched pins have been rotatably mounted in the front and rear ends of the seat bars presenting notches that slidably engage the front and rear legs respectively. The construction has been such that the notches in the pins extend around the legs of the side frames less than half circular so that if warping or racking action occurs between the seat bars and their respective side frames due to the chair traversing a rough or uneven surface the notched pins are free to separate from their respective legs which they slidably engage.

An object of the present invention is to provide an improved construction for connecting the end of a seat bar to a leg of a side frame which can be very inexpensively produced and assembled and which has the advantage of encircling or embracing a leg of a side frame more than one-half circular. The construction provides a rotatable and slidable connection between the end of the seat bar and the leg of the side frame and if warping or racking action between the seat bar and the side frame should occur the connection remains in slidable embrace with the leg due to its encircling more than a half circle thereof.

Another object of the invention is to provide an improved collapsible wheel chair having the above mentioned characteristics and wherein one end of each seat bar instead of being rotatably and slidably connected to a leg of the side frame is left free or unattached and when the chair is in expanded or extended position this end is merely received in an upwardly open socket rigidly mounted on the seat frame.

Another object of the invention is to provide an improved and simplified construction whereby foot rests may be detachably mounted on the side frames of a collapsible chair.

With the foregoing and other objects in view, which will be made manifest in the following detailed description and specifically pointed out in the appended claims, reference is had to the accompanying drawings for an illustrative embodiment of the invention wherein:

Fig. 1 is a view in side elevation of an invalid wheel chair embodying the present invention.

Fig. 2 is a sectional view taken substantially upon the line 2—2 of Fig. 1.

Fig. 3 is a partial view in vertical section taken substantially on the line 3—3 of Fig. 1.

Fig. 4 is a partial view in horizontal section taken substantially upon the line 4—4 of Fig. 1.

Fig. 5 is a perspective view of one of the parts forming the connection between the rear ends of the seat bars and the rear legs of the side frames.

Referring to the accompanying drawings wherein similar reference characters designate similar parts therein the improved chair comprises two opposed side frames generally indicated at **10** and **11**. These side frames are usually made of metal tubing providing substantially vertical rear legs **12** to the upper ends of which handles may be attached and front legs **13**. The front legs have their upper ends bent rearwardly to provide arm rests **14** and are welded or otherwise secured to the outer sides of the rear legs **12**. On the inner sides of the lower ends of the front legs **13** there are horizontally extending tubular rung portions **15** and similar portions **16** are attached to the lower ends of the rear legs **12**. These rung portions have tubular sleeves **17** rotatably mounted therebetween and the lower ends of one or more X-braces **18** are rigidly secured thereto. The members of each X-brace are pivotally connected to each other as at **19** and the upper ends of the X-braces have tubular seat bars **20** rigidly mounted thereon which are connected by a flexile seat **21**.

To collapse the chair as above described the two side frames **10** and **11** are merely pressed toward each other. This causes the X-braces **18** to collapse and the flexible seat **21** to fold between the upper ends of the X-brace. In the course of collapsing the X-braces the seat bars **20** must move upwardly relatively to the rear legs **12** and also to partially rotate relatively thereto.

One feature of the present invention concerns the means for slidably and rotatably connecting the rear ends of the seat bars **20** to their respecitve rear legs **12**. To this end two opposed members are provided for the rear end of each seat bar. These opposed members are illustrated at **22** and **23**. Each member may be formed of a metal stamping and consists of a semi-cylindrical shank portion, the shanks being indicated at **24** and **25** respectively. These semi-cylindrical shanks when the members are in opposed relationship rotatably fit in the rear ends of the seat bars so that the opposed members **22** and **23** can rotate within the rear ends of the seat bars as well as slide axially therein. The rear ends of the opposed members are shaped to provide two opposed arcuate claws **26** and **27** respectively. These claws slidably fit about the rear leg **12** and as will be noted from an inspection of Fig. 4 they partially embrace the leg around more than a semi-circle thereof. In other words, they extend from the shank portions **24** and **25** rearwardly beyond a transverse diameter through the rear leg **12**. Consequently, these claws although they are free to slide on the rear legs **12** cannot be pulled forwardly therefrom and therefore are in captive relation to the rear legs. If the seat bar **20** tends to move forwardly relatively to the rear leg **12** due to the warping or racking of the chair in passing over an uneven surface the claws merely cause the shank portions **24** and **25** to slide rearwardly a short distance from within the seat bars. When the chair returns to a smooth horizontal surface and the seat bar tends to move rearwardly toward the rear leg **12** the claws **26** and **27** cause the shank portions **24** and **25** to slide forwardly in the seat bar. In this manner there is a constant slidable and rotatable connection between the rear end of each seat bar and its vertical leg **12**.

On the inner sides of the forward legs **13** there are secured such as by welding tubular members **28** and to the tops of these tubular members are are secured upstanding flanges **29**. The flanges **29** cooperate with the tubular

members **28** and the inner sides of the front legs **13** to provide upwardly open sockets **30** into which the forward ends of the seat bars **20** drop in the course of expanding the chair from its collapsed position. It will thus be appreciated that it is unnecessary to provide a rotatable and slidable connection between the forward end of each seat bar and the forward leg **13**. The connection between the rear end of the seat bar and the rear leg **12** can if desired be duplicated at the forward end of each seat bar between the forward end of the seat bar and the forward leg **13**. However, by means of the connection at the rear as above described the simple socket **30** may be employed in lieu of the connection made up of the opposed members **22** and **23**.

By leaving the forward ends of the rung portions **15** and the tubular members **28** open these members may be utilized as forwardly open sockets adapted to receive the rearwardly extending portions **31** and **32** on foot rests **33**. These portions may be caused to slide into the rung portions **15** and into the tubular members **28** and can be detachably locked therein such as by spring actuated detents not shown which detachably connect the foot rests to the side frames and still enable the foot rests to be detached and removed from the chair.

The invention is applicable to any form of collapsible chair but it is usually employed on collapsible invalid wheel chairs wherein drive wheels **34** may be rotatably mounted on the rear legs **12** and caster wheels **35** may be mounted on the front legs **13**.

From the above described construction it will be appreciated that an improved and novel connecting means is provided between the rear ends of seat bars of a collapsible chair and legs of the side frames thereof. This connection maintains a slidable and rotatable connection between the seat bars and the rear legs at all times. It is easily and economically constructed and readily assembled with the remaining parts of the chair and enables the other ends of the seat bars to be free or detached from the side frames and merely enter sockets **30** on the side frames when the chair is extended.

Various changes may be made in the detail, arrangement and proportions of the invention without departing from the spirit of the invention.

I claim:

1. In a collapsible chair, a leg, a tubular seat bar having an end vertically movable and rotatable relative to the leg and means forming a slidable and rotatable connection between the end of the seat bar and the leg comprising two opposed parts having shank portions rotatably fitting in the end of the seat bar and having opposed claws in partially encircling captive relationship with the leg and in slidable engagement therewith.

2. In a collapsible chair, a leg, a tubular seat bar, and a connection between the seat bar and the leg comprising two opposed parts having opposed portions in partially encircling captive relation to the leg and slidably engaging therewith, said parts having opposed shank portions rotatably fitting within the end of the seat bar.

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